## 10.0 CORRECTIVE ACTIONS

Laboratory corrective actions shall be implemented to resolve problems and restore proper functioning to the analytical system when errors, deficiencies, or out-of-control situations exist at the laboratory. Full documentation of the corrective action procedure needed to resolve the problem shall be filed in the project records, and the information summarized in the case narrative. A discussion of the corrective actions to be taken is presented in the following sections.

## 10.1 INCOMING SAMPLES

Problems noted during sample receipt shall be documented on a Cooler Receipt Form. The USACE/URS Managers shall be contacted immediately for problem resolution. All corrective actions shall be documented thoroughly.

## 10.2 SAMPLE HOLDING TIMES

If any sample extraction and/or analyses exceed method holding time requirements, USACE/URS Managers shall be notified immediately for problem resolution. All corrective actions shall be documented thoroughly.

## 10.3 INSTRUMENT CALIBRATION

Sample analysis shall not be allowed until all initial calibrations meet the appropriate requirements. All laboratory instrumentation must be calibrated in accordance with USACE Shell requirements (USACE, 2001). If any initial/continuing calibration standards exceed method QC limits, recalibration must be performed, and if necessary, reanalysis of all samples affected back to the previous acceptable calibration check.

## 10.4 REPORTING LIMITS

The laboratory must meet all project-required detection limits. If difficulties arise in achieving these limits due to a particular sample matrix, the laboratory must notify USACE/URS project personnel for problem resolution. In order to achieve those detection limits, the laboratory must utilize all appropriate cleanup procedures (e.g., sulfur and acid cleanup for Method 8082) in an attempt to retain the project required detection limits. When any sample requires a secondary dilution due to high levels of target analytes, the laboratory must document all initial analyses and secondary dilution results. Secondary dilution will be permitted only to bring target analytes within the linear range of calibration. If samples are analyzed at a secondary dilution with no target analytes detected, USACE/URS Managers will be immediately notified so that appropriate corrective actions can be initiated, if necessary.

The laboratory will report all detections below the MRL but above the MDL and flag these semiquantitative data points as estimated.

## 10.5 METHOD QC

All QC, including blanks, matrix duplicates, matrix spikes, matrix spike duplicates, surrogate recoveries, laboratory control samples, and other method-specified QC samples, shall meet the requirements referenced in Table 6-1. Failure of QC will result in the review and possible qualification of all affected data. If the laboratory cannot find any errors, the affected sample(s) shall be reanalyzed and/or re-extracted/redigested, then reanalyzed within method-required holding times to verify the presence or absence of matrix effects. If matrix effect is confirmed, the corresponding data shall be flagged accordingly using the flagging symbols and criteria as defined by the data validation guidelines identified in Section 11.3. If matrix effect is not confirmed, then the entire batch of samples may have to be reanalyzed and/or re-extracted/redigested, then reanalyzed at no cost to the Government. The USACE shall be notified as soon as possible to discuss possible corrective actions should unusually difficult sample matrices be encountered.

## 10.6 CALCULATION ERRORS

All analytical results must be reviewed systematically for accuracy prior to submittal. If upon data review, calculation and/or reporting errors exist, the laboratory will be required to reissue the analytical data report with the corrective actions appropriately documented in the case narrative.